



Western States  
Rural Transportation  
Consortium



## SYSTEMS ENGINEERING DEVELOPMENT AND INTEGRATION PROGRAM

### Automated Safety Warning System Controller

#### The Problem

California has many different warning systems on the state's highways, disseminating warnings via changeable message signs (CMS), Highway Advisory Radio (HAR), and flashing beacons, all of which play an important role in traveler safety. These warning systems often depend on data collected from sensors in the field. Sensor data may be interpreted in a TMC or maintenance shop, where decisions are made about the issuance of warnings. This dependency on human interaction may slow what otherwise could be a timely activation of a warning. Further, every such system to date has been a unique implementation with custom controllers and one-of-a-kind software specific to a particular set of ITS field elements and a certain warning system type. This distinctiveness poses many challenges to TMC operators and maintenance personnel, especially when the warning systems are located in remote locations.

#### The Solution

An Automated Safety Warning System Controller (ASWSC) that interfaces with roadside sensors and warning systems (i.e., CMS or HAR) in a standardized way was developed to address the challenges associated with numerous unique warning systems. The controller collects automated data and applies best practice algorithms to analyze sensor data and actuate appropriate warning messages and signals. It can operate autonomously, be remotely accessible, and is able to internetwork with a Transportation Management Center (TMC) or other automated systems. The controller also has extensive programming/scripting capability which allows field engineers to easily program decision processes.

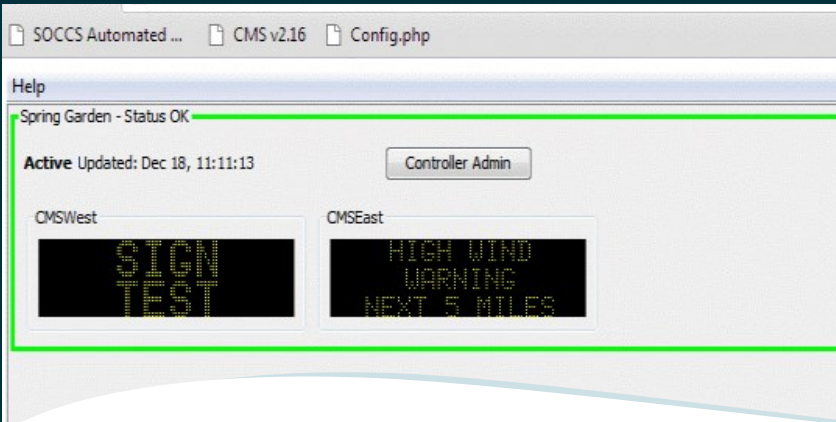
During the first two phases of the project, a hardware and software system was developed and tested in the field. The pilot system was developed on an industrial hardware platform and standard Linux. However, the Linux-based Advanced Transportation Controller (ATC) can facilitate deployment more easily and is now widely available. The anticipated end product of Phase III will be an updated version of the ASWSC software, modified to run on the ATC.



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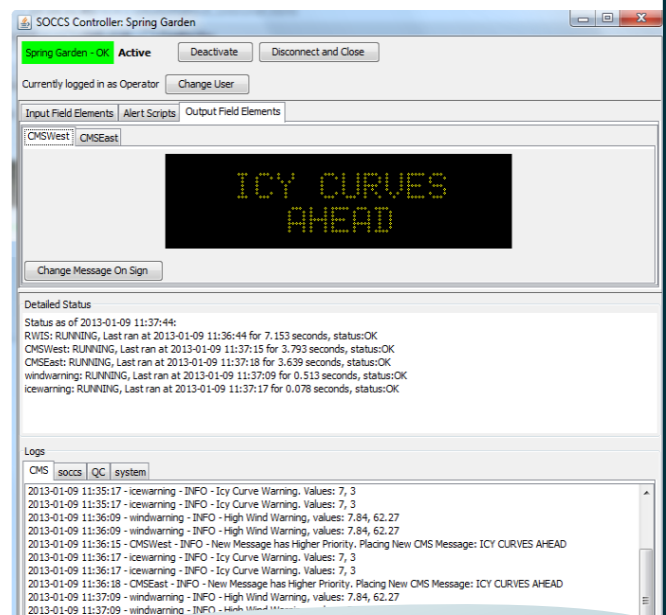
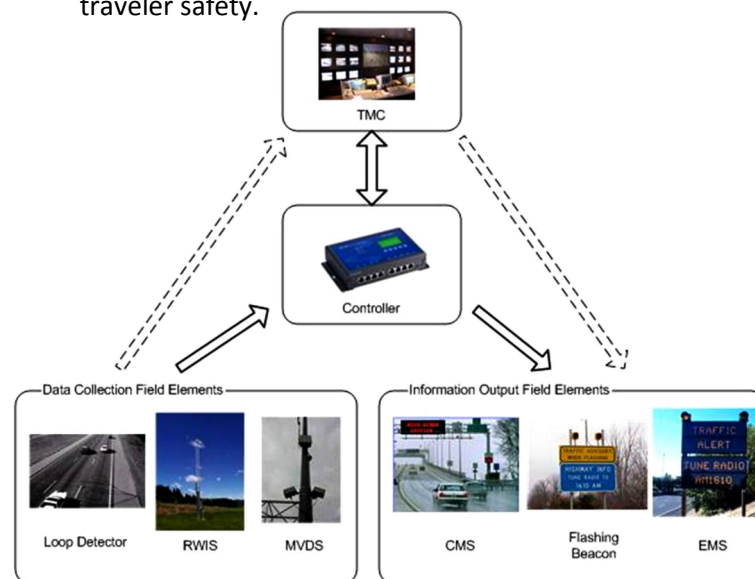
# Automated Safety Warning System Controller



## Benefits

The Controller System moves decision making intelligence to the roadside. This is critical in a rural environment where communications are often unreliable. The ASWSC has been designed for flexibility and extensibility, allowing for the integration and control of a variety of roadside devices. As such, it could potentially be used as a standardized component with widespread applicability. The standardized use of such a device would likely result in decreased maintenance costs, improved reliability, and greater flexibility in implementation when compared with "one-of-a-kind" deployments. Other benefits include:

- A controller that can interface with various field sensors/elements and safety warning systems in a uniform manner will enhance operations and avoid a multitude of unique systems.
- An automated controller for safety warning systems can improve traveler safety with more timely and relevant warning messages.
- Using commercial off the shelf equipment makes the automated controller an economical solution.
- The ability to remotely access the controller will reduce the cost of service for warning systems.
- TMC operators and field engineers will have the ability to adjust decision thresholds in response to changing weather, road, and incident conditions. This improves effectiveness and efficiency and in turn improves traveler safety.



For further information, please visit [www.westernstates.org/Projects/Controller](http://www.westernstates.org/Projects/Controller), or contact

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